RES2DINV x 32/ x 64

2D RESISTIVITY IMAGING

and IP Inversion Software

For Windows/XP/Vista/7

Two-dimensional (2D) electrical imaging surveys are now widely used to map areas of moderately complex geology where 1D resistivity sounding surveys are inadequate.

The RES2DINVx32/x64 programs use the smoothness-constrained Gauss-Newton least-squares inversion technique (Sasaki 1992) to produce a 2D model of the subsurface from the apparent resistivity data. It is completely automatic and the user does not even have to supply a starting model. On a modern PC, the inversion of a single pseudosection is usually completed within seconds to minutes. It supports the Wenner, Schlumberger, pole-pole, pole-dipole, dipoledipole, multiple gradient and non-conventional arrays.

The program will automatically choose the optimum inversion parameters for a data set. However, the inversion parameters can be modified by the user. The smoothing filter can be adjusted to emphasize resistivity variations in the vertical, horizontal or diagonal directions.
It can also be optimized to produce models with smooth boundaries (for eg. chemical plumes), or with sharp boundaries (for eg. fracture zones).
Resistivity information from borehole and other sources can also be included to constrain the inversion process. Known boundaries where an abrupt change in the resistivity occurs can also be incorporated in the inversion model. Three different techniques for topographic modeling (Loke 2000) are available. The complex resistivity method (Kenma et al. 2000) is used for IP data inversion.

- **Supports on land, underwater and cross-borehole surveys**
- **Supports smooth and sharp contrasts inversions**
- **Supports multi-core CPUs with 32 bit and 64-bit Windows versions**
- **Supports up to 16,000 electrodes and 100,000 data points with almost any electrode arrangement**
- **Fast seamless inversion of very long survey lines using sparse inversion techniques**

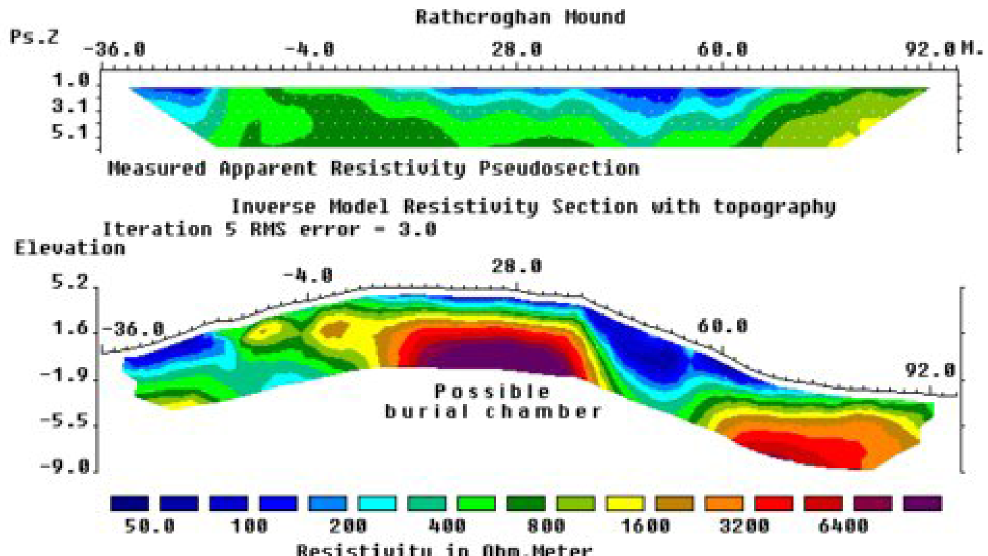

Figure 1

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Figure 1 shows an example from an electrical imaging survey in an area with fairly complex subsurface geology and significant surface topography.

Figure 1 Rathcroghan mound survey (a) apparent resistivity pseudosection, (b) computer inversion model. This survey was carried out across a circular mound that is thought to contain some important Irish archaeological burial chambers (Waddell and Barton 1995). The inversion of this data set with 67 electrode positions and 339 data points takes seconds on a modern PC.

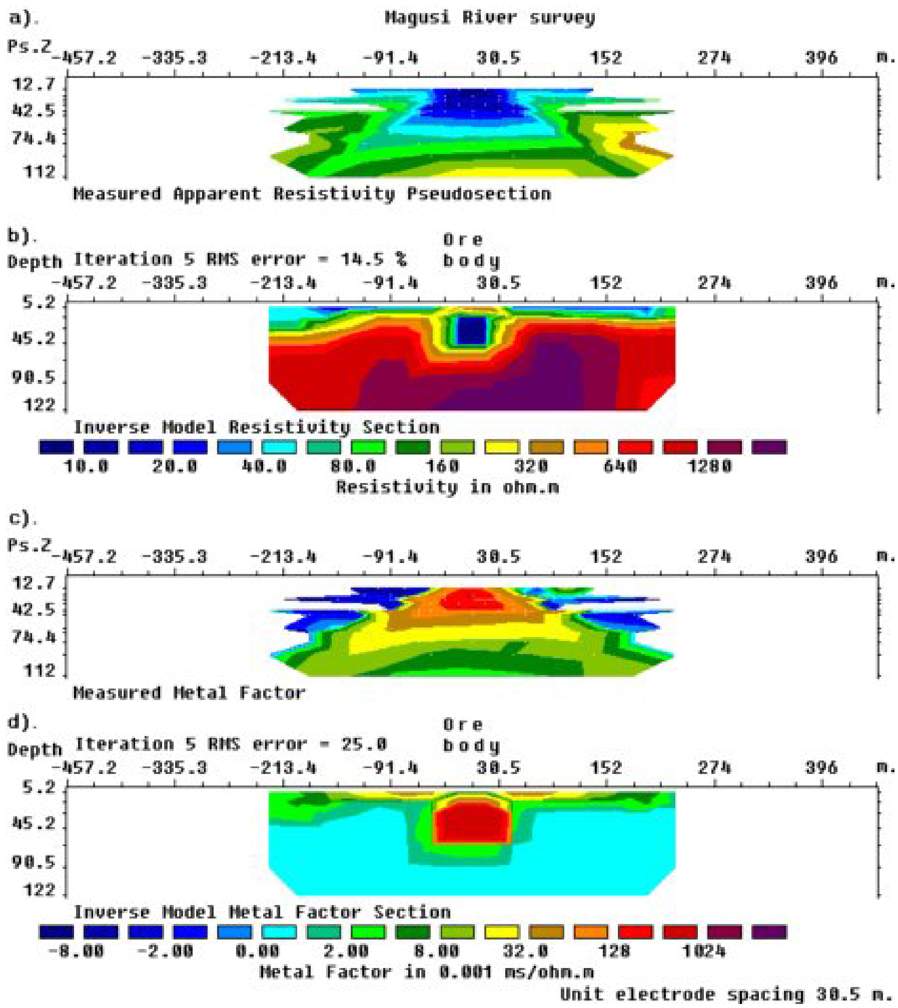

Figure 2

The second example is from a combined resistivity and IP survey over the Magusi River massive sulphide ore body (Edwards 1977).

This survey was conducted with 30.5 meters, 61.0 meters and 91.4 meters dipoles. The resulting pseudosection has a complex distribution of data points with overlapping data levels measured with different dipole spacings. The apparent resistivity and IP pseudosections, together with the model sections are shown in Figure 2. The ore body shows up as a distinct low resistivity body with high IP values near the middle of the survey line in the model sections. Note the sharp boundaries between ore body and the surrounding rocks.

Figure 2. Magusi River ore body survey. (a) Apparent resistivity and (b) model sections. (c) Apparent metal factor and (d) model sections.

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